

**TRIP REPORT
FOR
12th STREET LANDFILL/DUMP SITE
WILMINGTON, DELAWARE**

Prepared for

U.S. Environmental Protection Agency Region 3
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1.0 INTRODUCTION

Under the Eastern Area Superfund Technical Assessment and Response Team (START) contract, the U.S. Environmental Protection Agency (EPA) Region 3 tasked Tetra Tech EM Inc. (Tetra Tech) to conduct a sampling event under technical directive document (TDD) No. 03-00-07-003 at the 12th Street Landfill in Wilmington, Delaware. This trip report provides background information; summarizes site activities; provides analytical results for the samples collected on February 13, 15, and 21, 2001; and discusses future actions at the site.

2.0 BACKGROUND

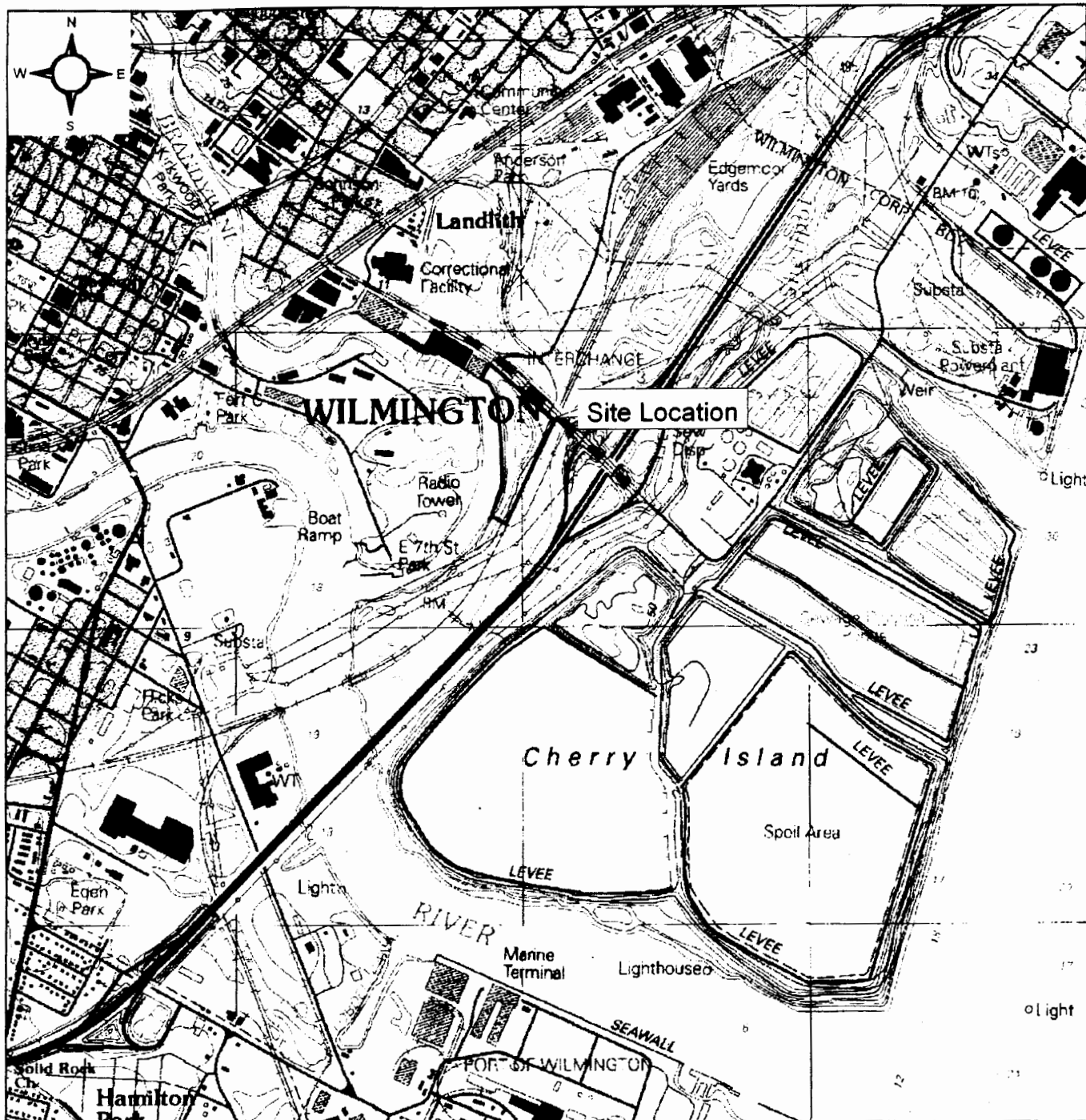
This section briefly describes the location, layout, and history of the site.

2.1 SITE LOCATION

The 12th Street Landfill is located along Brandywine Creek near the 12th Street on-ramp to Interstate (I-) 495 in Wilmington, Delaware (see Figure 1). The site is situated along the eastern bank of Brandywine Creek approximately ½ mile upstream of the Christina River and approximately 100 yards downstream of the outflow of Shellpot Creek. Bordering the site are the Brandywine Creek to the south and west, commercial and industrial properties (including Asset Recovery Services) to the north, 12th Street and land owned by Norfolk Southern Railroad Company and Delaware Department of Corrections to the north and east across 12th Street, a cement plant to the east, and I-495 to the east and south. In addition, a Norfolk Southern Railroad Company rail spur runs adjacent to the northeastern boundary of the site, and wetland areas are present between the southern boundary of the site and I-495.

2.2 SITE DESCRIPTION

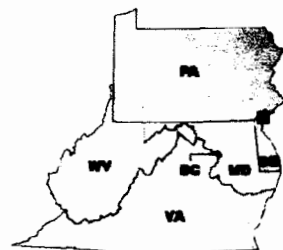
The 12th Street Landfill covers approximately 5 acres. The site is the scene of an ongoing EPA Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) removal action involving a former landfill/dump used for the disposal of waste rubber hoses and lead castings generated from former operations at the Electric Hose & Rubber Company facility. Contamination at the site consists primarily of high concentrations of metals (primarily lead with some arsenic) and phthalate compounds (primarily bis (2-ethylhexyl) phthalate) in site soil. During site operations, various sampling was performed to characterize site conditions, including the presence of additional potential source areas and the migration of contaminants.



Source: Modified from 7.5-Minute Series USGS Topographic Quadrangle, Wilmington South, DEL-NJ, 1993

0 0.25 0.5 Miles

Quadrangle Location = ■



12TH STREET LANDFILL SITE
WILMINGTON, NEW CASTLE COUNTY, DELAWARE



FIGURE 1
SITE LOCATION MAP



EPA Contract No. 68-S3-00-02, TDD No. 03-00-07-003 Tetra Tech EM Inc.

2.3 SITE HISTORY

Since April 2000, the 12th Street Landfill has been the scene of an ongoing EPA CERCLA removal action designed to stabilize soil at the site. Site soil is contaminated with metals, primarily lead with some arsenic. To date, the removal action has included the consolidation and regrading of soil and debris at the site, stabilization of the bank along Brandywine Creek using articulated concrete blocks (ACBs), and installation of a 2-foot soil cap over areas of known contamination. Historical aerial photographs indicate that waste disposal similar to that conducted within the current site boundaries may have occurred in the area across 12th Street. In addition, discharges from the former Electric Hose & Rubber Company facility just north of the site are suspected to have contributed contamination to Brandywine Creek. This facility is reportedly being investigated under separate authority by representatives of the Delaware Department of Natural Resources and Environmental Control (DNREC).

3.0 SITE ACTIVITIES

Tetra Tech conducted the sampling described in this document to investigate other possible sources of contamination associated with the site, primarily the area across 12th Street observed on historical aerial photographs and discharges to Brandywine Creek from the former Electric Hose & Rubber Company facility. This section summarizes sampling and sample handling activities for the 12th Street Landfill.

3.1 SAMPLING DESCRIPTION

Site sampling activities were conducted on Tuesday, February 13; Thursday, February 15; and Wednesday, February 21, 2001. Samples could not be collected on consecutive dates because of inclement weather and property access issues. Soil and sediment samples were collected using either a stainless-steel split-spoon sampling device or a disposable plastic scoop. These samples were then homogenized in a dedicated aluminum pan before being placed in 8-ounce pre-cleaned glass sampling jars. Surface water samples were collected by lowering the pre-cleaned sampling jars into water, and allowing them to fill. Sediment and surface water samples were collected shortly after high tide events.

3.2 SAMPLING ACTIVITY SUMMARY

During the sampling event, a total of 10 surface soil samples, 9 sediment samples, and 10 surface water samples were collected. A summary of sampling locations is included in Table 1, and the sampling locations are illustrated on Figures 2 and 3. Surface soil samples were collected from areas northeast of the current site boundary (across 12th Street along the former Shellpot Creek) in order to characterize other potential sources of contamination. Four background sediment samples and four background

LEGEND

★ Sampling location

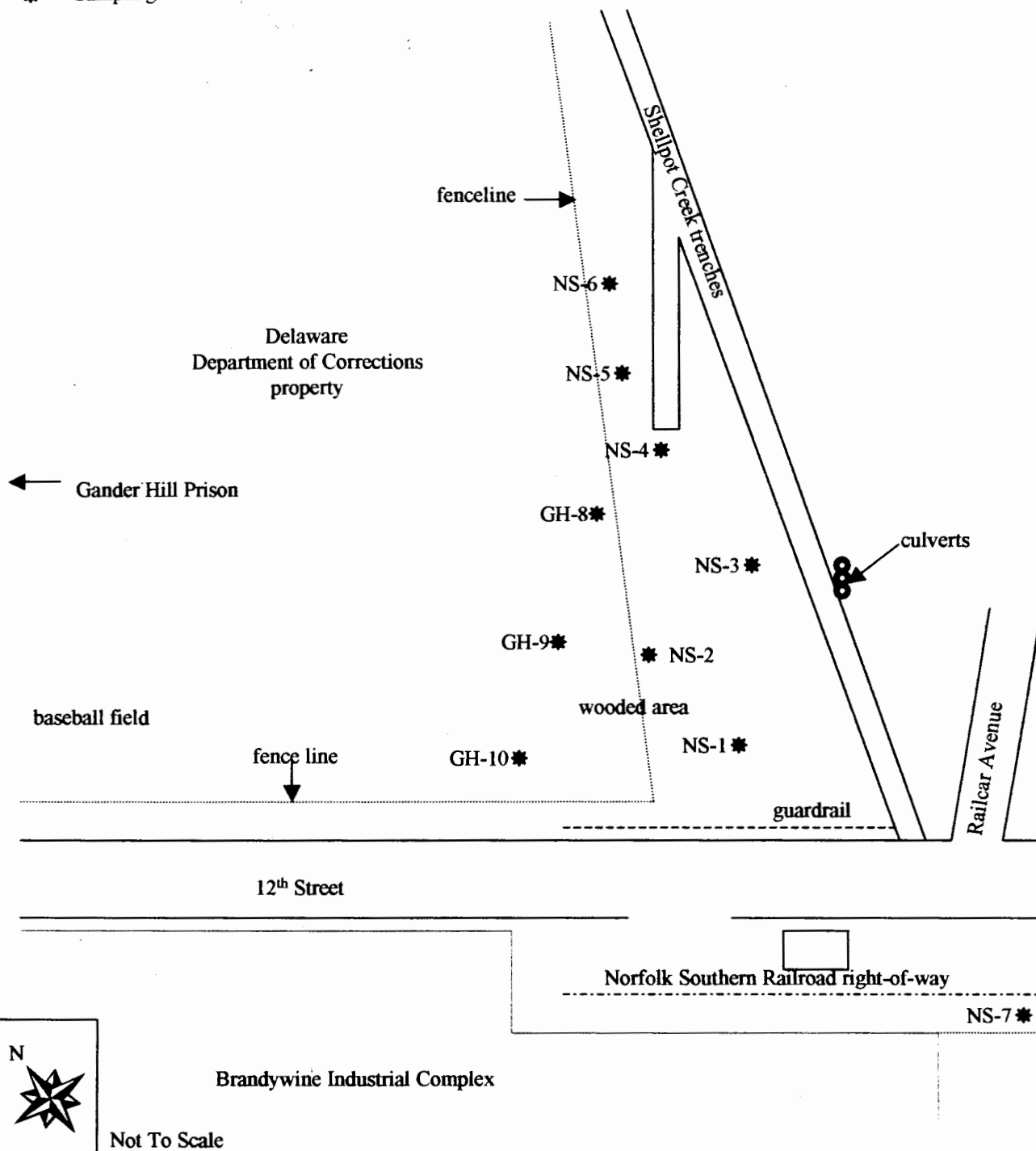
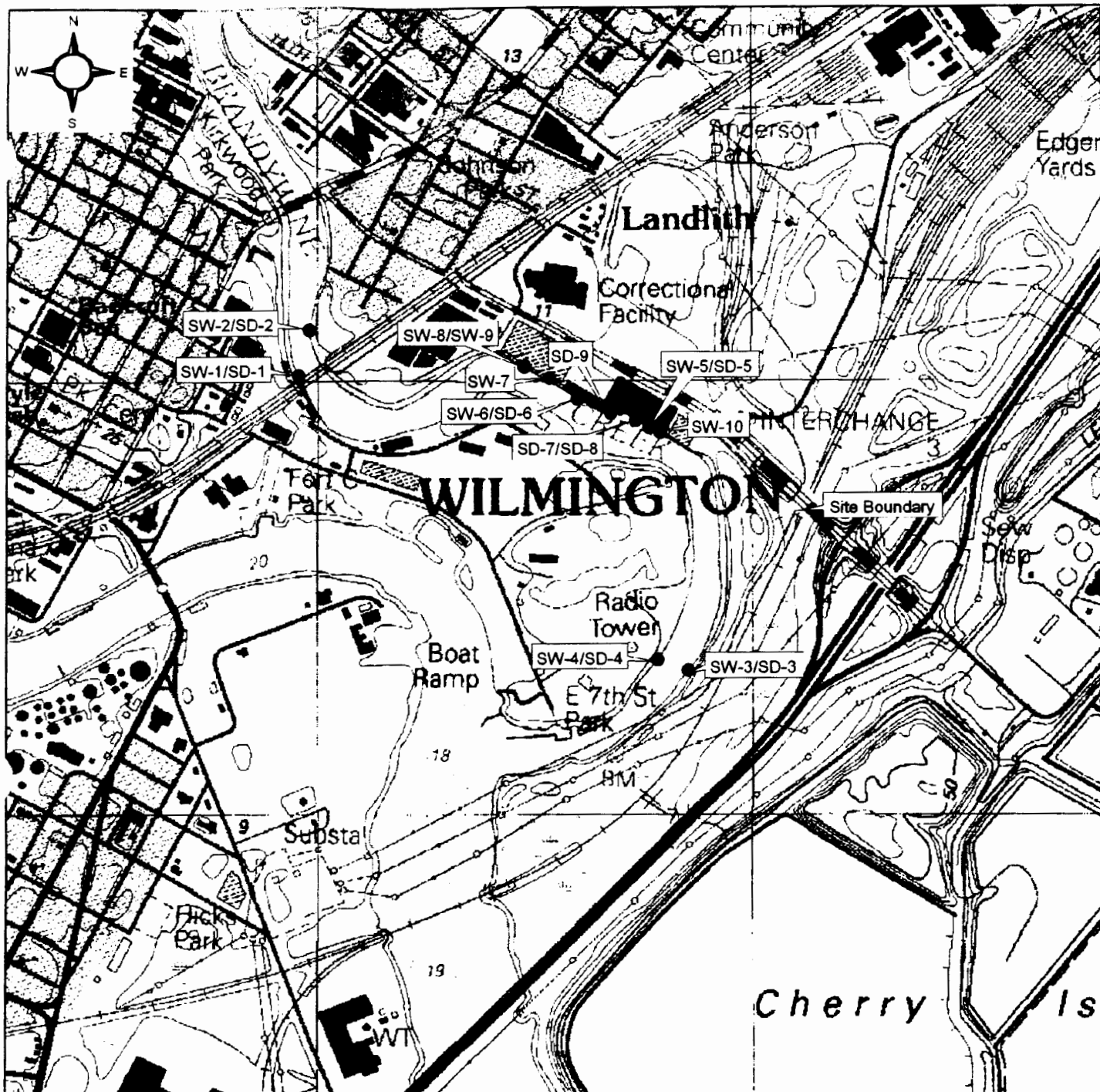


FIGURE 2: SURFACE SOIL SAMPLING LOCATION MAP

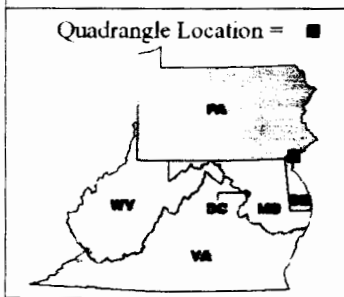


12th Street Landfill
 Wilmington, New Castle County, Delaware
 EPA Contract No. 68-S3-00-02 TDD No. 03-00-07-003





Source: Modified from USGS 7.5-Minute Series Topographic Quadrangle. Wilmington South. DEL-NJ. 1993



12TH STREET LANDFILL SITE
WILMINGTON, NEW CASTLE COUNTY, DELAWARE



FIGURE 3
SEDIMENT AND SURFACE WATER
SAMPLING LOCATION MAP



EPA Contract No. 68-S3-00-02. TDD No. 03-00-07-003

Tetra Tech EM Inc.

surface water samples were collected from areas upstream and downstream of the site. The remaining sediment and surface water samples were collected from areas along the sea wall located just northwest of the site to identify other potential sources of contamination.

TABLE 1
SAMPLE LOCATION SUMMARY

Sample ID	Date	Time	Depth (inches)	Location	Description
NS-1	2/13/01	1025	0-6	north of 12 th Street	dark, organic loamy soil (dry to moist)
NS-2	2/13/01	1035	0-6	north of 12 th Street	dark, organic loamy soil (dry to moist)
NS-3	2/13/01	1045	0-6	north of 12 th Street	tan to brown, silty clay (moist to wet)
NS-4	2/13/01	1055	0-6	north of 12 th Street	tan to brown, silty clay (moist to wet)
NS-5	2/13/01	1105	0-6	north of 12 th Street	tan to brown, silty clay (moist to wet)
NS-6	2/13/01	1115	0-6	north of 12 th Street	tan to brown, silty clay (moist to wet)
NS-7	2/13/01	1130	0-6	south of 12 th Street	fill material
GH-8	2/21/01	1215	0-6	"right field" of prison baseball field-wooded section along fenceline north of 12 th Street	dark, organic loamy soil (moist)
GH-9	2/21/01	1220	0-6	"right field" of prison baseball field-wooded section along fenceline north of 12 th Street	dark, organic loamy soil (moist)
GH-10	2/21/01	1225	0-6	"right field" of prison baseball field-wooded section along fenceline north of 12 th Street	dark, organic loamy soil (moist)
SW-1/SD-1	2/15/01	1000	0-6	upstream background sample collected from west bank of Brandywine Creek adjacent to railroad bridge	surface water/sediment
SW-2/SD-2	2/15/01	0945	0-6	upstream background sample collected from east bank of Brandywine Creek approximately 100 yds upstream of railroad bridge	surface water/sediment
SW-3/SD-3	2/15/01	0925	0-6	downstream background sample collected from west bank of Brandywine Creek directly across from weir/dam	surface water/sediment
SW-4/SD-4	2/15/01	0905	0-6	downstream background sample collected from east bank of Brandywine Creek approximately 300 ft downstream of dam/weir	surface water/sediment

Sample ID	Date	Time	Depth (inches)	Location	Description
SW-5/SD-5	2/15/01	1120	0-6	along sea wall beneath discharge pipe (see figure 3)-pipe was under water	surface water/sediment
SW-6/SD-6	2/15/01	1145	0-6	along sea wall beneath 12-inch diameter discharge pipe - sediment collected from just behind sea wall-water was visibly flowing behind sea wall	surface water/sediment
SW-7	2/15/01	1200	0-6	collected from 4-inch diameter discharge pipe along sea wall-water was draining down sea wall, apparently from the building	surface water
SD-7	2/21/01	1325	0-6	mud flat along sea wall	gravelly-looked like roofing material
SW-8	2/21/01	1345	NA	east edge of Brandywine Creek along sea wall	surface water
SD-8	2/21/01	1320	0-6	duplicate of SD-7	gravelly-looked like roofing material
SW-9	2/21/01	1340	NA	duplicate of SW-8	surface water
SD-9	2/21/01	1335	0-6	collected from just behind crumbling section of sea wall and beneath building foundation-appeared to be creek sediment deposited during tidal events	sandy and gravelly
SW-10	2/21/01	1310	NA	along sea wall	surface water

3.3 SAMPLE HANDLING SUMMARY

All samples collected during the sampling event were handled and packaged in accordance with the EPA approved sampling plan dated December 21, 2000, and were shipped to Chem Tech Laboratories in Edison, New Jersey for analysis.

4.0 ANALYTICAL RESULTS

All samples collected during the sampling event were analyzed for Target Analyte List (TAL) metals, semivolatile organic compounds, and pesticides/polychlorinated biphenyls (PCBs). The analytical results for surface soil, sediment, and surface water samples collected during the sampling event are summarized in Tables 2, 3, and 4. Copies of the analytical data packages are included in the attachment.

The sample analytical results indicate elevated concentrations of lead and some semivolatile organic compounds (primarily polyaromatic hydrocarbons) in the surface soil on the property northeast of the current site boundaries across 12th Street and in the sediment on the mudflat located along the sea wall bordering the eastern bank of Brandywine Creek. Concentrations of other contaminants in soil, sediment,

and surface water samples were within three times background concentrations.

5.0 FUTURE ACTIONS

EPA will evaluate the sample analytical data to determine the most appropriate cleanup method for contaminated sediment. In addition, EPA will evaluate the sample analytical data to determine appropriate future actions to address contaminated soil located across 12th Street from the current site boundaries. Because of the presence of PCBs, it is likely that Oil Pollution Act funding will not be available and that actions will be required to be conducted under CERCLA.

TABLE 2
ANALYTICAL SUMMARY FOR
SURFACE SOIL SAMPLES

Compound	Sample Identification and Analytical Results (mg/kg)									
	NS-1	NS-2	NS-3	NS-4	NS-5	NS-6	NS-7	GH-8	GH-9	GH-10
TAL Metals										
Arsenic	26.9	18.9	12.5	24.3	17.2	35.4	25.6	9.4	8.2	7.9
Chromium	75.6	45.1	39	107	57.2	61.4	84.7	27.6	28.4	30.1
Lead	5,340	50,100	366	716	3,710	1,880	5,200	743	658	7,930
Semivolatile Organic Compounds										
Acenaphthylene	ND	0.082 (J)	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	ND	0.098 (J)	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	ND	0.082 (J)	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	0.49	0.96	0.21 (J)	ND	0.43 (J)	0.15 (J)	0.11 (J)	0.066 (J)	0.16 (J)	0.19 (J)
Anthracene	0.1 (J)	0.25 (J)	ND	ND	0.094 (J)	ND	ND	ND	ND	ND
Fluoranthene	0.81	1.6	0.37 (J)	0.13 (J)	0.7	0.23 (J)	0.22 (J)	0.13 (J)	0.38 (J)	0.31 (J)
Pyrene	0.67	1.5	0.26 (J)	0.11 (J)	0.57	0.17 (J)	0.19 (J)	0.097 (J)	0.28 (J)	0.24 (J)
Butylbenzylphthalate	0.057 (J)	0.091 (J)	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	0.38 (J)	0.85	0.14 (J)	0.063 (J)	0.32 (J)	0.085 (J)	0.11 (J)	0.048 (J)	0.15 (J)	0.14 (J)
Chrysene	0.45 (J)	0.91	0.18 (J)	0.078 (J)	0.39 (J)	0.12 (J)	0.14 (J)	0.063 (J)	0.19 (J)	0.15 (J)
Bis(2-ethylhexyl)phthalate	0.22 (J)	0.28 (J)	ND	0.099 (J)	0.088 (J)	ND	0.48 (J)	0.062 (J)	0.07 (J)	0.09 (J)
Benzo(b)fluoranthene	0.61	1.4	0.17 (J)	0.09 (J)	0.45 (J)	0.13 (J)	0.17 (J)	0.074 (J)	0.22 (J)	0.16 (J)
Benzo(k)fluoranthene	0.28 (J)	0.47 (J)	0.12 (J)	ND	0.24 (J)	ND	0.087 (J)	ND	0.12 (J)	0.083 (J)
Benzo(a)pyrene	0.39 (J)	0.85	0.15 (J)	0.062 (J)	0.33 (J)	0.091 (J)	0.12 (J)	0.049 (J)	0.15 (J)	0.12 (J)
Indeno(1,2,3-cd)pyrene	0.11 (J)	0.21 (J)	0.057 (J)	ND	0.099 (J)	ND	ND	ND	0.065 (J)	ND
Benzo(g,h,i)perylene	0.096 (J)	0.21 (J)	0.06 (J)	ND	0.092 (J)	ND	ND	ND	0.059 (J)	ND
Pesticides/PCBs										
4,4-DDE	0.0047	0.0025 (J)	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor 1260	ND	ND	ND	ND	ND	ND	ND	0.043 (J)	0.018 (J)	0.01 (J)

TABLE 3
ANALYTICAL SUMMARY FOR
SEDIMENT SAMPLES

Compound	Sample Identification and Analytical Results (mg/kg)								
	SD-1	SD-2	SD-3	SD-4	SD-5	SD-6	SD-7	SD-8	SD-9
TAL Metals									
Arsenic	6.9	4.7	27.3	15.8	12.1	4.6	6.0	13.5	2.5
Chromium	386	37	60	47.9	359	39.1	54.2	153	21.7
Lead	179	96.8	151	173	397	169	1,300	1,750	122
Semivolatile Organic Compounds									
Benzaldehyde	ND	ND	ND	ND	ND	ND	0.11 (J)	ND	ND
2-Methylphenol	ND	ND	ND	ND	ND	ND	0.13 (J)	0.063 (J)	ND
3&4 Methylphenols	ND	0.14 (J)	ND	ND	ND	0.42	0.31 (J)	0.16 (J)	ND
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	0.20 (J)	0.093 (J)	ND
Naphthalene	ND	ND	ND	ND	0.074 (J)	ND	11.0 (J)	3.6	ND
2-Methylnaphthalene	ND	ND	ND	ND	ND	ND	3.4	1.5	ND
1,1'-Biphenyl	ND	ND	ND	ND	ND	ND	1.4	0.58	ND
Dimethylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	0.12 (J)
Acenaphthylene	ND	ND	ND	ND	ND	ND	0.16 (J)	0.089 (J)	ND
Acenaphthene	ND	ND	ND	ND	0.22 (J)	ND	18.0	7.6	ND
Dibenzofuran	ND	ND	ND	ND	0.066 (J)	ND	9.5	3.2	ND
Diethylphthalate	0.054 (J)	ND	ND	ND	ND	ND	0.41 (J)	0.18 (J)	ND
Fluorene	ND	ND	ND	ND	0.13 (J)	ND	13.0	4.1	ND
Phenanthrene	0.1 (J)	0.067 (J)	ND	0.11 (J)	1.2	0.11 (J)	100.0	41.0	0.23 (J)
Anthracene	ND	ND	ND	ND	0.3 (J)	ND	22.0	10.0	0.44 (J)
Carbazole	ND	ND	ND	ND	0.16 (J)	ND	15.0	6.4	ND
Di-n-butylphthalate	ND	ND	ND	ND	ND	ND	ND	0.38 (J)	ND
Fluoranthene	0.16 (J)	0.14 (J)	0.058 (J)	0.22 (J)	1.5	0.23 (J)	110.0	48.0	0.39 (J)
Pyrene	0.14 (J)	0.11 (J)	ND	0.27 (J)	1.3	0.19 (J)	110.0	46.0	0.29 (J)
Butylbenzylphthalate	ND	ND	ND	ND	ND	ND	0.71 (UJ)	0.53 (UJ)	ND
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	0.71 (UJ)	0.53 (UJ)	ND

Compound	Sample Identification and Analytical Results (mg/kg)								
	SD-1	SD-2	SD-3	SD-4	SD-5	SD-6	SD-7	SD-8	SD-9
Benzo(a)anthracene	0.067 (J)	ND	ND	0.13 (J)	0.79	0.099 (J)	58.0	25.0	0.17 (J)
Chrysene	0.091 (J)	0.09 (J)	ND	0.13 (J)	0.86	0.13 (J)	60.0	25.0	0.20 (J)
Bis(2-ethylhexyl)phthalate	ND	0.088 (J)	ND	0.16 (J)	1.7	0.11 (J)	0.66(J)	0.53 (UJ)	ND
Di-n-octyl phthalate	ND	ND	ND	ND	ND	ND	0.71(UJ)	0.53 (UJ)	ND
Benzo(b)fluoranthene	0.086 (J)	0.1 (J)	ND	0.26 (J)	0.94	0.15 (J)	100.0	39.0	ND
Benzo(k)fluoranthene	ND	ND	ND	0.071 (J)	0.5 (J)	0.091 (J)	19.0	3.9 (J)	0.28 (J)
Benzo(a)pyrene	0.062 (J)	0.069 (J)	ND	0.15 (J)	0.67	ND	52.0	19.0	0.18 (J)
Indeno(1,2,3-cd) pyrene	ND	ND	ND	ND	0.23 (J)	ND	13.0	6.5	0.62 (J)
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND	1.40(J)	0.56(J)	ND
Benzo(g,h,i)perylene	ND	ND	ND	0.058 (J)	0.2 (J)	ND	11.0	4.0(J)	0.63 (J)
Pesticides/PCBs									
4,4-DDE	ND	ND	ND	0.0067	0.0016 (JP)	ND	10	6.7	ND
4,4-DDD	ND	ND	ND	0.011 (P)	ND	ND	ND	ND	ND
4,4-DDT	ND	ND	ND	0.032 (P)	ND	ND	ND	ND	ND
Aroclor 1260	ND	ND	ND	0.044 (J)	ND	ND	ND	ND	ND

TABLE 4
ANALYTICAL SUMMARY
SURFACE WATER SAMPLES

Compound	Sample Identification/Analytical Summary (ug/L)									
	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8	SW-9	SW-10
TAL Metals										
Arsenic	ND	ND	ND	ND	ND	ND	ND	ND	[5.2]	[5.8]
Chromium	ND	ND	ND	20.8	ND	ND	ND	[1.4](K)	ND	[1.2]K
Lead	ND	41.2	ND	40.5	ND	ND	13	[2.0](J)	1.5(J)	4.1
Semivolatile Organic Compounds										
di-n-butylphthalate	1 (J)	1.7 (J)	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate	ND	ND	3.9 (J)	ND	1.2 (J)	ND	1.6 (J)	ND	ND	ND

Notes:

TAL Target Analyte List
 PCBs polychlorinated biphenyls
 mg/kg milligrams per kilogram
 ug/L micrograms per liter
 ND not detected
 U not detected
 J estimated result; actual value may be higher or lower
 K biases result; actual value expected to be higher

REFERENCES

U.S. Environmental Protection Agency. No date. 12th Street Landfill/Dump Site – Site File.

U.S. Geological Survey. 7.5–Minute Series Topographic Map of Wilmington South, DE-NJ Quadrangle
1993.